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SPECIFICATION FOR EDIBLE SOYA PROTEIN ISOLATE

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SPECIFICATION FOR EDIBLE SOYA PROTEIN ISOLATE

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Indian Standard

SPECIFICATION FOR EDIBLE SOYA PROTEIN ISOLATE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 September 1976, after the draft finalized by the Nutrition Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 During the past few years, an increasing area has gradually been brought under soyabean cultivation, and this is expected to go up in years to come as crop rotations are further diversified. Soyabean protein is rich in lysine, an essential amino acid and can therefore serve as a nutritionally useful ingredient in blended and processed foods. Proteins from soyabean are now being manufactured in the country in many forms such as high, medium and low fat flours and protein isolates and there is scope for developing others. This standard is intended to help the manufacturers of various grades of soyabean flours in optimising their operation, as well as the users of such products in choosing the right quality of soya protein in the manufacture of processed foods.

0.2.1 Edible soya protein isolate shall be prepared from low-fat soya flour (*see* IS : 7835-1975*) which is debittered (for example, by extraction with a polar solvent) followed by extraction of the protein with alkali, centrifugation, steam deodorization of the extract, and isolation followed by drying of the protein isolate in a suitable manner.

0.3 Separate Indian Standards have been issued to cover requirements of full-fat, medium-fat and low-fat soya flours and of soya protein isolate. As such the two Indian Standards, covering edible soya flour (expeller pressed) (IS : 5275-1969) now redesignated as medium-fat soya flour and edible soya flour (solvent extracted) (IS : 5276-1969) now redesignated as low-fat soya flour, are being withdrawn.

0.3.1 Soya protein isolate is of particular functional value in products like protein-based beverages, yoghurt, (*DAHI*), whipped creams, emulsified foods and pharmaceutically-oriented products (*see* Table 3).

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*Specification for edible low-fat soya flour.

0.4 To get the best out of soya products which are used as a protein source, they should be heat-treated. Varying the degree of heat treatment of soya products progressively and simultaneously raises the protein efficiency or quality, inactivates such enzymes as trypsin inhibitors, urease and lipoxygenases and lowers the nitrogen solubility index. Such heat treatment can be applied to all soya protein products, whether full-fat, medium-fat, low-fat flours or isolate. Moist heat treatment destroys the several anti-nutritional enzymes present in soyabeans and reduces their activity. Dry heat treatment raises the quality of the protein present, but overheating lowers it. The optimum kind and degree of heat treatment to be applied to soya protein for use in any particular food product, depends therefore, on the nature and extent of heating which subsequent manufacture of that food product entails if good protein quality is to be ensured. In order to help food manufacturers, guidelines recommending usage of edible soya protein products is given in Appendix A.

0.5 This standard has been formulated in close collaboration with the protein Foods and Nutrition Development Association of India.

0.6 In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these rules, wherever applicable.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for edible soya protein isolate.

2. REQUIREMENTS

2.1 Description — It shall be in the form of coarse or fine powder or grits; white to creamy-white in colour, of uniform composition; and free from rancid odour; extraneous matter; and insect, rodent and fungal infestation. It shall be free from any artificial colouring matter or flavouring agents.

2.2 It shall also conform to the requirements given in Table 1.

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*Rules for rounding off numerical values (*revised*).

TABLE 1 REQUIREMENTS FOR EDIBLE SOYA PROTEIN ISOLATE

(*Clause* 2·2)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO APPENDIX IN IS : 4684-1975*
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	6·0	B
ii)	Protein, percent by mass, *Min*	86	C
iii)	Total ash, percent by mass, *Max*	7·0	D
iv)	Acid-insoluble ash, percent by mass, *Max*	0·3	E
v)	Fat, percent by mass, *ax*	0·3	F
vi)	Crude fibre, percent by mass, *Max*	0·8	H

NOTE — Requirements except Sl No. (i) shall be on dry basis.

*Specification for edible groundnut flour (expeller pressed) (*first revision*).

2.3 Particle Size — Particle size shall be as agreed to between the purchaser and the vendor.

2.4 Hygienic Conditions — The soya protein isolate shall be manufactured, packed, stored and distributed, under hygienic conditions (*see* IS : 2491-1972*).

2.5 Bacteriological Requirements — The edible soya protein isolate shall be tested periodically to comply with the requirements given in Table 2.

TABLE 2 BACTERIOLOGICAL REQUIREMENTS FOR EDIBLE SOYA PROTEIN ISOLATE

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO
(1)	(2)	(3)	(4)
i)	Total bacterial count per g, *Max*	50 000	IS : 5402-1969*
ii)	Coliform bacterial count per g, *Max*	10	IS : 5401-1969†
iii)	*Salmonella* sp	Nil	IS : 5887-1970‡

*Method for plate count of bacteria in foodstuffs.

†Methods for detection and estimation of coliform bacteria in foodstuffs.

‡Methods for detection of bacteria responsible for food poisoning and food-borne diseases.

---

*Code for hygienic conditions for feed processing units (*first revision*).

3. PACKING AND MARKING

3.1 Packing — The product shall be packed in polyethylene or polyethylene-lined jute bags, or in clean tinplate containers. When packed in bags the mouth of each bag shall be either machine- or hand-stitched. If hand-stitched the mouth shall be rolled over and stitched. Stitches shall be in two cross-rows with at least 14 stitches in each row.

3.2 Marking — The following particulars shall be marked or labelled on each containers :

a) Name of the product;
b) Name and address of the manufacturer;
c) Batch or code number;
d) Net mass;
e) Nitrogen solubility index;
f) Fortificate added, if any; and
g) Date of manufacture.

3.3 BIS Certification Marking

The product may also be marked with Standard Mark.

3.3.1 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

4. SAMPLING

4.1 Representative samples of the material shall be drawn and tested for conformity to this standard as prescribed in IS : 5315-1969*.

5. TESTS

5.1 Tests shall be carried out as prescribed in Tables 1 and 2.

5.2 Quality of Reagents — Unless otherwise specified, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

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*Methods of sampling for milled cereals and pulses products.

†Specification for water, distilled quality (*revised*).

APPENDIX A

(*Clause* 0.4)

GUIDELINES FOR PRODUCT USAGE

A-1. SELECTION OF EDIBLE SOYA PROTEIN PRODUCTS

A-1.1 For selecting the right quality of the soya protein material depending on the end use of the product, guidelines for protein and enzyme quality are given in Table 3.

TABLE 3 GUIDELINES FOR SELECTION OF EDIBLE SOYA PROTEIN PRODUCTS FOR SPECIFIC END USES

Sl No.	Products in Which Flour or Isolate is Used	Relative Protein Efficiency	Nitrogen Solubility Index	Trypsin Inhibitor Activity, Units	Urease Test, Difference in *p*H
(1)	(2)	(3)	(4)	(5)	(6)
i)	Baked goods as a bleaching agent (bread, biscuits)	45	90 *Min*	90 *Min*	Above 1·0
ii)	Products involving moist cooking (bread, biscuits, buns, cakes, extruded foods)	55 to 65	80 to 60	75 *Max*	0·6 to 0·9
iii)	Products involving dry cooking or roasting and which will not require further cooking or will only be lightly cooked before consumption (protein mixes, powders, protein-fortified cereals and flours, fried snacks)	65 to 75	60 to 40	55 *Max*	0·3 *Max*
iv)	Products involving simple mixing of ingredients with little or no cooking and which will be consumed without any cooking (protein powders or mixes, baby foods, animal feeds)	80	30 *Max*	40 *Max*	0·05 *Max*
v)	Products in which dispersibility is essential (beverages, yoghurt, whipped emulsions or cream, certain pharmaceuticals)	90	90 *Max*	Negligible	Negligible

Note — Relative protein efficiency is expressed as percentage of the full potential of soya protein.

A-2. TESTS

A-2.1 Determination of the nitrogen solubility index, trypsin inhibitor activity and urease activity shall be carried out according to the methods prescribed in Appendices B, C and D of IS : 7837-1975* and protein efficiency ratio according to IS : 7481-1974†.

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*Specification for edible full-fat soya flour.

†Method for determination of protein efficiency ratio (PER).

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